

**IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA
HUNTINGTON DIVISION**

**OHIO VALLEY ENVIRONMENTAL
COALITION, et al.,**

Plaintiffs,

v.

Case No. 2:15-cv-1371

FOLA COAL COMPANY, LLC,

Defendant.

DEFENDANT'S POST-TRIAL BRIEF

I. INTRODUCTION

In prior cases, this Court has found that conductivity was both a general and specific cause of stream impairment. In those cases, conductivity was frequently above 3,000 $\mu\text{S}/\text{cm}$ and WVSCI scores—which West Virginia has historically used to help measure impairment—were routinely below 60.¹ This case is different. The conductivity levels have generally ranged from 1,500 to 2,000 $\mu\text{S}/\text{cm}$ —levels tolerated by many aquatic insects. And while the WVSCI scores have varied, they have frequently been much higher than in past cases before this Court.

The WVSCI scores introduced at trial were as follows:

Stream	October 2015 (OVEC)	April 2016 (OVEC)	April 2016 (Fola)	August 2016 (OVEC)	August 2016 (Fola)
Leatherwood	75.4	73.7	66.4	54.7	60.2
Elick	57.9	75.9	65.6	52.5	61.7
Shanty	69.4	58.0	66.9	58.3	59.9

¹ See *OVEC, et al. v. Elk Run Coal Co., Inc.*, 24 F.Supp.3d 532, 564-66, 571-73 (S.D.W.Va. 2014) (conductivity levels predominantly 3,000-4,000 $\mu\text{S}/\text{cm}$, WVSCI scores in 40s and 50s); *OVEC, et al. v. Fola Coal Co., LLC*, 82 F.Supp.3d 673, 696-97 (conductivity 2,600-4,000 $\mu\text{S}/\text{cm}$, WVSCI scores in 30s to 50s); *OVEC, et al. v. Fola Coal Co., LLC*, No. 2:13-cv-21588, 2015 WL 4772351, **23, 25-26 (S.D.W.Va. Aug. 12, 2015) (conductivity in Road Fork 1,800-5,700 $\mu\text{S}/\text{cm}$, WVSCI scores in 30s to 50s; conductivity in Cogar Hollow consistently 3,000-5,000 $\mu\text{S}/\text{cm}$, WVSCI score 41.8).

Stipulation of the Parties (ECF No. 48) at 13-14.² These scores do not paint a clear picture of impairment. Each stream has at least one passing score. In both October 2015 and April 2016, the average WVSCI scores at two of the three sites exceeded 68. Transcript of Bench Trial (“Tr.”) at 34, 46-47. And more recent scores also indicate that these streams are not impaired.³

Plaintiffs want the Court to assume that these streams are impaired and to skip to an analysis of specific causation. But they rely on shaky evidence. Some of the failing WVSCI scores calculated by Plaintiffs were based on sampling conducted in violation of required protocols. Others were collected after a historic storm, the type of storm that can cause depressed WVSCI scores. And some scores were collected in locations that receive discharges from locations other than the Monoc No. 2 surface mine. If all that fails, Plaintiffs ask the Court to use a new test (GLIMPSS) that has never been used by West Virginia or this Court to define impairment. Plaintiffs’ evidence is inconsistent and suspect. They have not met their burden of proof.

II. BACKGROUND

In 2001, West Virginia adopted the West Virginia Stream Condition Index (“WVSCI”), a multi-metric index designed to measure the health of West Virginia streams. To prepare the WVSCI, West Virginia assigned a score to 107 reference streams based on six attributes. Def.’s Ex. (“DE”) 45 at 21.⁴ Of the 107 streams studied, 95% received a WVSCI score of 68 or higher. *Id.* As a result, West Virginia has historically used a WVSCI score of 68 to determine whether streams are of reference quality; streams with lower scores have been listed as impaired under Section 303(d) of the Clean Water Act, 33 U.S.C. § 1313(d). *Elk Run*, 24 F.Supp.3d at 550.

² The Stipulation of the Parties states that the August 2016 score obtained by OVEC for Leatherwood Creek was 58.3. At trial, Dr. Christopher Swan testified that this was an error, and that the actual score was 54.7. Tr. at 31-32.

³ Fola has moved to supplement the record with WVSCI scores compiled after trial. See Def.’s Motion to Supp. the Record or in the Alternative for a New Trial (ECF No. 78).

⁴ In citing Defendant’s Exhibits, references to page numbers are to that document’s internal pagination.

Based on West Virginia's past practice, this Court has determined that streams with a WVSCI score below 68 are violating West Virginia's narrative water quality standards found at W.Va. Code St. R. §§ 47-2-3.2(e) and (i). *Id.* at 550, 556.

WVSCI scores are heavily influenced by the number and percentage of "EPT taxa"—commonly known as mayflies, stoneflies and caddisflies. Tr. at 113. The six attributes that make up a WVSCI score are shown below:

Table 6-1. West Virginia final SCI: Metric standard values and standardization formulas.

Metrics that decrease with stress	Standard (best value) X_{95}	X_{\min}	Standardization formula (Appendix A.5 , Equation 2; X=metric value)
Total taxa	21	0	score = $100 \times (X/21)$
EPT taxa	13	0	score = $100 \times (X/13)$
%EPT	91.9	0	score = $100 \times (X/91.9)$
Metrics that increase with stress	Standard (best value) X_5	X_{\max}	Standardization formula (Appendix A.5 , Equation 3; X=metric value)
%Chironomidae	0.98	100	score = $100 \times [(100-X)/(100-0.98)]$
% 2 dominant	36.0	100	score = $100 \times [(100-X)/(100-36.0)]$
HBI (family)	2.9	10	score = $100 \times [(10-X)/(10-2.9)]$

Final index score (SCI) for a site is determined by averaging the site's 6 standardized metric scores, using a maximum metric score of 100 for any metric whose individual score at a site may have exceeded 100.

DE 45 at 21.

In 2011, EPA recommended a conductivity benchmark of 300 $\mu\text{S}/\text{cm}$ for West Virginia streams ("Benchmark"). DE 47. Importantly, the conductivity benchmark of 300 $\mu\text{S}/\text{cm}$ is not tied to any particular WVSCI score. Instead, 300 $\mu\text{S}/\text{cm}$ is the conductivity level derived to protect 95% of the 163 different aquatic insect species in West Virginia streams. Figure 8 from the Benchmark shows the sensitivity of each of the 163 aquatic insect species to conductivity. As demonstrated by Figure 8, only 5% of aquatic insects are extirpated at conductivity levels of 300 $\mu\text{S}/\text{cm}$; the remaining 95% of aquatic insects tolerate higher levels of conductivity:

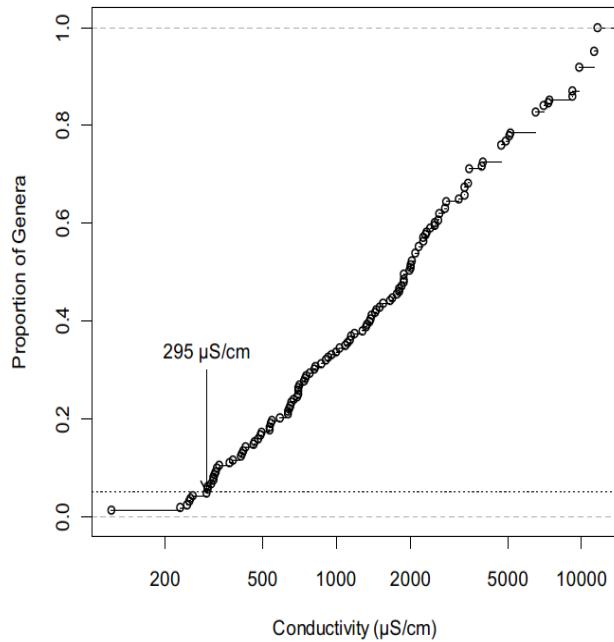


Figure 8. The species sensitivity distribution. Each point is an XC_{95} value for a genus. There are 163 genera. The HC_{05} ($295 \mu\text{S}/\text{cm}$) is the conductivity at the intercept of the SSD with the horizontal line at the 5th centile.

DE 47 at 35.

A similar pattern occurs for every order of insect. For instance, the order *Ephemeroptera*—commonly known as the mayfly—has some species that are extirpated at conductivity levels of $300 \mu\text{S}/\text{cm}$, but the vast majority of mayflies tolerate higher conductivity levels. Indeed, as shown in Figure A-1 from the Benchmark, several mayfly species tolerate conductivity levels higher than $1,000 \mu\text{S}/\text{cm}$:

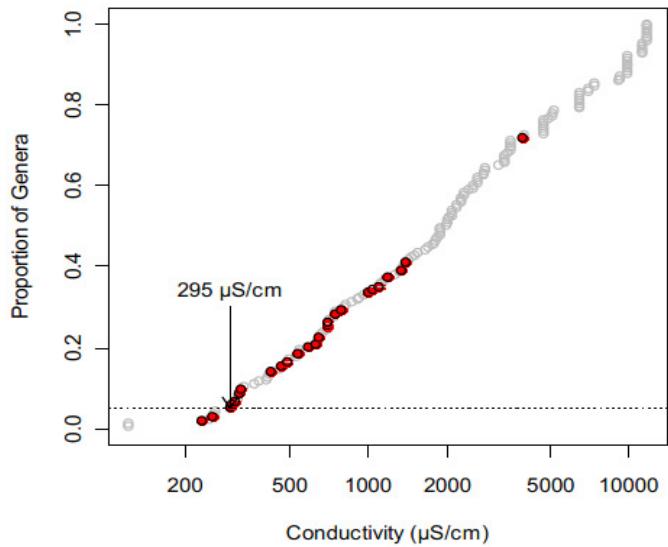


Figure A-1. The genera in the Order Ephemeroptera, as a group, are extirpated at lower conductivity levels than many other taxonomic groups. The plot is a species sensitivity distribution (SSD). Open circles represent the 95th centile extirpation concentration (XC_{95}) for a genus. The closed circles are genera of the Order Ephemeroptera. The genus at 230 $\mu\text{S}/\text{cm}$ is *Cinygmulia* and at 3,923 $\mu\text{S}/\text{cm}$ is *Caenis*.

DE 47 at 65.

While the number and percentage of EPT taxa are important in deriving a WVSCI score, the index gives no greater weight to EPT taxa that are sensitive to conductivity. Tr. at 113 (Baker), 114 (Verslycke). Instead, streams can achieve a passing WVSCI score with EPT taxa that are tolerant of conductivity. Tr. at 179 (King). Indeed, as demonstrated at trial, the streams at issue in this case achieved passing WVSCI scores largely due to the presence of conductivity-tolerant EPT taxa. Tr. at 114-21 (Baker). Consistent with this, conductivity levels cannot be used to accurately predict WVSCI scores. Dr. Baker conceded this point at trial. Tr. at 326. As Dr. Verslycke made clear, conductivity is a poor predictor of WVSCI scores. Tr. at 255. If used as a predictive tool, the EPA Benchmark would project a WVSCI score below 50 for the streams at

issue in this case. E 47 at 98. But as we know, the scores in Leatherwood, Shanty Branch, and Elick Hollow have routinely been much higher than 50.

III. ARGUMENT

Even though the conductivity levels in the streams at issue have been constant, the WVSCI scores have been highly variable. Fola's expert, Dr. Tim Verslycke, explained that it would be wrong to make assumptions about impairment in the face of such varying scores. Tr. at 256-57. Plaintiffs, however, never attempted to explain the variability in the WVSCI scores. Instead, they ignore it. But, as explained below, much of the variability in the scores can be attributed to the manner in which the data were gathered. When incompetent data are removed, the picture becomes clearer. And that picture does not show that these streams are impaired.

A. Plaintiffs Cannot Ignore the Data from Leatherwood Creek

In their complaint, Plaintiffs alleged that discharges from the Monoc No. 2 surface mine are causing impairment in three streams: Leatherwood Creek and two of its tributaries, Shanty Branch, and Elick Hollow. Paragraph 53 of the complaint states as follows:

Since at least 2008, Fola has discharged and continues to discharge pollutants which cause ionic stress and biological impairment in Leatherwood Creek and its tributaries in violation of the narrative water quality standards for biological integrity and aquatic life protection. 47 C.S.R. §§ 2-3.2.e & 2-3.2.i.

Complaint for Declaratory and Injunctive Relief (ECF No. 1) at 16 (emphasis added). *See also id.* at ¶48 (“[D]ischarges from Outlets 005 and 011 have caused or materially contributed to biological impairment in Leatherwood Creek.”). Consistent with this claim, Plaintiffs conducted sampling and computed WVSCI scores in all three streams.

But Plaintiffs encountered problems with their claim in Leatherwood Creek. First and foremost, two out of three WVSCI scores gathered by Plaintiffs in Leatherwood Creek were

passing scores. Second, Plaintiffs could not tie any of the WVSCI scores in Leatherwood Creek to the Monoc No. 2 surface mine. Although there are multiple discharges into Leatherwood Creek from multiple sources, Plaintiffs' experts made no effort to quantify the relative contribution of the Monoc discharges or to isolate the impact of those discharges from other discharges. Tr. at 111.⁵ Appropriately, this Court granted a motion in limine that prohibited Plaintiffs from offering such evidence at trial. Order (ECF No. 64) at 1.

Rather than simply withdraw their claim regarding Leatherwood Creek, Plaintiffs now pretend as if no such claim was ever asserted. In their post-trial brief, they show only the WVSCI scores for Shanty Branch and Elick Hollow. Pltfs.' Post-Trial Br. (ECF No. 77) at 6. And, they fault Fola for spending "a substantial amount of time on the WVSCI scores in the Left Fork of Leatherwood Creek," arguing that "[a]s a legal matter, the impaired character of Leatherwood Creek is only a relevant issue at the relief stage in this case." *Id.* at 6 n. 3.

Plaintiffs are wrong. Their claim regarding Leatherwood Creek requires them to show not only that Leatherwood Creek is impaired, but also that Fola caused or materially contributed to that impairment. Plaintiffs have done nothing to support this claim. As a result, Fola and the Court have been forced to waste resources addressing a claim that Plaintiffs did not try to prove, but would not formally withdraw. Fola is entitled to judgment on Plaintiffs' claim that the Monoc No. 2 surface mine caused impairment in Leatherwood Creek. And Plaintiffs should not be allowed to pretend as if the passing WVSCI scores in Leatherwood Creek do not exist.

⁵ See also DE 65 (map showing Leatherwood and discharge points in Shanty and Elick); Tr. at 203-06 (Ray Ewing explaining that Outlets 005 and 011 are not sole contributors to drainage in Leatherwood).

B. Plaintiffs Cannot Ignore the October 2015 Data in Shanty Branch and Leatherwood Creek

At trial, Plaintiffs suggested that the WVSCI scores in Shanty Branch and Leatherwood Creek were artificially inflated because the streams were “seeded” with aquatic insects. But Plaintiffs offered nothing more than speculation in this regard.

Sometime in September or October 2015, an employee of Fola attempted to remediate the impacts of a spill in Shanty Branch by depositing buckets of cobble from another stream. When Fola learned of these events, it promptly notified Plaintiffs. In a subsequent interrogatory response, Fola described the incident as follows:

The sludge curtain located in Pond 2 above Outlet 011 in Shanty Branch failed sometime during the week of September 13, 2015, causing iron sludge to discharge into the stream. In order to reduce the impact of the sludge release and rehabilitate the stream, sometime between September 18, 2015 and October 9, 2015, [...] the on-site project engineer responsible for the Monoc No. 2 surface mine at that time [and] an environmental consultant retained by Defendant [...] applied ten to twelve five-gallon buckets of substrate consisting of creek gravel and leaf litter obtained from Beech Fork of Buffalo Creek to various points in the stream bed of Shanty Branch. This addition of substrate may have introduced macroinvertebrates or other organisms into Shanty Branch and/or Leatherwood Creek.

PE 52 at 2. *See also* Tr. at 105.

While Plaintiffs suggest that these activities led to passing WVSCI scores, they provided no support for this theory at trial. Dr. Baker conceded that he had only “heard a vague mention” of the issue and did not know how much cobble was added to Shanty Branch or where it came from. Tr. at 122. For that reason, he would not say that the addition of cobble made a difference, but only that it “could have.” Tr. at 122-23. And not one of Plaintiffs’ experts testified that aquatic insects would likely have been gathered with the cobble or have survived the process of being dumped into and out of buckets. Indeed, even if any aquatic insects had survived this

process, Plaintiffs offered little reason to believe the organisms would stay in the streams and be sampled. According to Plaintiffs' experts, aquatic insects drift away upon encountering high conductivity. Tr. at 97, 106-07, 166.⁶

Certainly, the list of aquatic organisms found in Shanty Branch and Leatherwood Creek does not support Plaintiffs' theory. In past cases, Plaintiffs' experts have been quick to assess the condition of a stream based on the types of aquatic insects found there—but not here. Plaintiffs' experts did not testify that the types of aquatic insects found in Leatherwood Creek or Shanty Branch showed evidence of “seeding”—nor could they. As demonstrated at trial, Shanty Branch and Leatherwood Creek achieved passing WVSCI scores largely due to the presence of EPT taxa that are tolerant of elevated conductivity. Tr. at 114-22 (Baker). As Plaintiffs themselves point out, no conductivity-sensitive mayflies were found. Tr. at 164 (King). The aquatic insects found in these streams are conductivity-tolerant taxa that one would expect to find there. Indeed, the taxa list in Shanty Branch and Leatherwood Creek looks much like the taxa list in Elick Hollow, which was unaffected by the so-called “seeding.” DE 37.

In summary, it is unfortunate that cobble was added to Shanty Branch. But this unauthorized activity was undertaken to address an issue unrelated to this case—a release of sludge from a treatment pond. It was promptly reported to Plaintiffs, who had the opportunity to take additional samples and to assess whether the process of adding cobble made any difference. There is no indication that the addition of cobble artificially inflated the WVSCI scores.

⁶ Plaintiffs want to have it both ways with respect to drift. They argue that the addition of cobble in Shanty Branch could have led to passing WVSCI scores not only in Shanty Branch, but also in Leatherwood Creek because aquatic insects could have drifted downstream to avoid conductivity. Tr. at 106-07. This is both speculative and illogical. The distance from Shanty Branch to the monitoring station in Leatherwood Creek is “well over a mile.” Tr. at 206 (Ewing). Plaintiffs offered no explanation for how or why a sufficient number of insects “seeded” in Shanty Branch could have drifted downstream and come to rest precisely at the Leatherwood monitoring station so as to create a passing WVSCI score there, while simultaneously, a sufficiently diverse population stayed behind in Shanty Branch to also inflate that WVSCI score.

C. Plaintiffs Cannot Rely on WVSCI Scores Where Dr. Swan Failed to Collect Enough Aquatic Insects or Otherwise Failed to Comply with the Required Protocol

In each case where Plaintiffs' expert, Dr. Christopher Swan, calculated a WVSCI score below 68 in October 2015 and April 2016, he violated the WVDEP-required sampling protocol. Where there was no evidence that he violated the sampling protocol in October and April, his sampling yielded passing WVSCI scores.

WVDEP's Watershed Assessment Branch maintains standard operating procedures to ensure that field samples are "comparable for use with current MMI [multi metric indices]" such as the WVSCI. DE 46 at 5-7. That protocol is comprised of four primary steps: (1) locating the sample sites in riffle-run areas; (2) setting up the collection net facing upstream; (3) removing large cobble from sample area just upstream of the net and brushing them to ensure that insects clinging to them "flow into the net"; and (4) "kicking" the smaller substrate material by shuffling the feet vigorously to a depth of 10 centimeters just upstream of the net for 20 seconds to dislodge aquatic insects and allow them to flow into the collection net. DE 46 at 5-7 to 5-8; Tr. at 207-11 (Ewing).

Fola's consultant Ray Ewing, who has used the protocol during his history of over 500 sampling events, explained the importance of steps 3 and 4. If the larger rocks within the area to be "kicked" are not removed before the kicking begins, then the kicking does not penetrate into the substrate and dislodge the organisms residing there so they can drift into the net. Tr. at 201-02, 211. Likewise, if those rocks are removed from the sampling area, but are not brushed of insects clinging to them, then the insects do not make their way into the sampling net, thereby diminishing the sample size. Tr. at 209 (Ewing). And if the kicking process is appreciably shorter than the required 20 seconds, then obviously the same risk occurs. Importantly, if a sample yields less than a total number of 100 insects, then the protocol says the organisms should be carefully

scrutinized for comparability before they are used for WVSCI scoring. DE 46 at 5-43; Tr. at 265-67 (Verslycke).

Dr. Swan, Plaintiffs' consultant, sampled insects in Leatherwood Creek, Elick Hollow, and Shanty Branch in October 2015. He obtained passing WVSCI scores in two of the three streams—a score of 75.4 in Leatherwood and 69.4 in Shanty Branch. DE 70; Tr. at 32-35. In Elick Hollow, he obtained a WVSCI score of 57.9, but he did not comply with required elements of the WVDEP sampling protocol and his samples did not yield 100 insects. Ray Ewing's primary task during Dr. Swan's sampling in both October 2015 and April 2106 was to monitor Swan's sampling techniques, and he took meticulous notes that he used to refresh his recollection at trial. Tr. at 212-15, 218, 234; DE 42. Mr. Ewing observed that in Elick Hollow, Dr. Swan kicked for far less time than required by the protocol and failed to clean substrate off of the cobble-sized rocks and remove them from the kick area prior to kicking in the finer substrate.⁷ By way of contrast, in Leatherwood, where Dr. Swan recorded a WVSCI score of 75.4, each of his kicks observed by Ray Ewing was closer to the 20 seconds mandated by the WVDEP protocol. Tr. at 217 (Ewing).

In April 2016, Dr. Swan sampled the same three streams again for Plaintiffs. Fola's consultant, Ray Ewing, assembled a team to sample in the same locations about an hour after Dr. Swan sampled. Tr. at 223-24. This time, Dr. Swan obtained passing WVSCI scores of 73.7 and 75.9 in Leatherwood and Elick Hollow, respectively, and the average of Plaintiffs' and Fola's

⁷ Fola's consultant, Ray Ewing, estimated the kick times for three of the four kicks as 11, 20, and 12 seconds and is absolutely confident that Dr. Swan failed to comply with the 20-second requirement of WVDEP's protocol. Tr. at 215-16. Plaintiffs' counsel tested Mr. Ewing's ability in the courtroom to accurately estimate 20 seconds without a watch. According to Plaintiffs' own counsel, Mr. Ewing was within one second in this estimation. Tr. at 229-30. Plaintiffs did not put their consultant to the same test, and in any event, Dr. Swan conceded that his counting was conducted while he was kicking the substrate and trying to keep his balance in the stream. Tr. at 49. Mr. Ewing also observed that Dr. Swan generally did not remove larger rocks before kicking (Tr. at 219) and did not brush the rocks off in his Elick Hollow sampling of October 2015. Tr. at 216-17 (Ewing).

scores in these streams also exceeded 70. DE 70; Tr. at 46-47 (Swan). The average for Shanty Branch was 62.8, but again Dr. Swan failed to follow the required protocol and collected only 85 insects.⁸ Indeed, Dr. Swan neither collected the 100 insects nor did he present any evidence that he conducted a “comparability” analysis necessary to yield a valid WVSCI score at Shanty Branch in April 2016. Tr. at 265-67 (Verslyke). Fola’s consultant collected 183 insects and calculated a near-passing WVSCI score of 67, despite sampling only about an hour later in a stream so narrow that a second sampler could not find an undisturbed sampling location in the same riffle-run complex. Tr. at 266-67 (Verslycke discussing Fola’s sample), 55-56 (Swan discussing challenges in Shanty).

D. Plaintiffs Cannot Rely on WVSCI Scores Compiled After the Historic June 2016 Storm

Because so many of the WVSCI scores from October 2015 and April 2016 were passing, Plaintiffs sampled again in August 2016. This time, Plaintiffs obtained WVSCI scores in the 50s for all three streams. ECF No. 48 at 13-14. Plaintiffs did not question why the scores were so much lower than in previous months despite relatively constant conductivity levels. Tr. at 32-37 (discussing WVSCI scores and conductivities). They simply noted that all the scores were below 68 and declared the streams unequivocally impaired as a result of elevated conductivity.

But the August 2016 scores are unreliable. Only two months earlier, in late June 2016, West Virginia experienced historic rains. Tr. at 269. The three streams at issue in this case were not spared. A local rain gauge on Fola’s property indicated that the Monoc No. 2 mine experienced a storm of such magnitude that it is expected to occur only once every 50 to 100

⁸ Dr. Swan’s WVSCI score in Shanty Branch was 58. He kicked for less than 20 seconds during the three kicks observed by Mr. Ewing and failed to remove the larger rocks before kicking. Tr. at 218-19 (Ewing).

years. Tr. at 271. Such storms can impact macroinvertebrates and depress WVSCI scores. *Id.* Even Plaintiffs' expert conceded this. Tr. at 349 (Baker).

But Plaintiffs sampled in August 2016 despite this historic storm event. Dr. Swan opined that as a "rule of thumb" it is appropriate to sample in streams approximately one month after a major rain storm. Tr. at 18. Dr. Swan said that his "rule of thumb" was based on experience, interaction with colleagues, and "folks that have published in this area," although he did not cite any experience with the effects of storms of this magnitude or any literature that supports this rule of thumb. Tr. at 19. *See also id.* at 51-52, 54. Indeed, even at trial Dr. Swan was oblivious to the magnitude of the June 2016 rain event. Tr. at 52-53 ("Absolutely I have reason to deny [that there was a 50- to 100-year storm event] because I haven't seen the data.").

Dr. Baker, who is a colleague of Dr. Swan's at the University of Baltimore Maryland County, similarly testified that it is appropriate to follow a one month rule of thumb following rain events, because it provides time for the "community to recover." Tr. at 350. But the scientific literature says otherwise. At trial, Dr. Baker was confronted with studies demonstrating that there is no rule of thumb for how long it takes aquatic communities to recover from flood events. One scientific paper, *Overview of Case Studies on Recovery of Aquatic Systems from Disturbance*, was prepared by an EPA author and others. Tr. at 354-55. It provided that recovery of macroinvertebrates from "pulse" disturbances like flooding typically occurs in "less than 18 months." Tr. at 356. And, Figure 5 in that paper showed the shortest recovery time for first order streams⁹ as 0.25 years, or 3 months. Tr. at 357.

Additionally, the paper provided recovery times for "macroinvertebrate biomass, total density, and genera richness" following flooding. Tr. at 359-60. This information was contained

⁹ Dr. Baker testified that Elick Hollow and Shanty Branch are first order streams. Tr. at 357.

in Table 9 of the paper, which was reviewed with Dr. Baker at trial. *Id.* The paper reported recovery times ranging from 0.17 years (63 days) to 1 year. *Id.* According to the paper, the recovery time for stoneflies (*Plecoptera*) was the longest of all the major insect groups. Tr. at 358-59. This is important because stoneflies are EPT taxa that had previously been present and contributed to passing WVSCI scores in October 2015 and April 2016. Tr. at 114.

Another scientific paper from the same authors, *Recovery of Lotic Communities and Ecosystems from Disturbance – A Narrative Review of Case Studies*, provided specific examples. Tr. at 362-64. These were reviewed with Dr. Baker at trial as well. *Id.* As Dr. Baker relayed, following a 300- to 400-year June flood in Pennsylvania, one researcher “felt that the stream had recovered within four months, even though populations of seven of 13 macroinvertebrate taxa were still depressed.” Tr. at 363. Similarly, another researcher studied the effects of an irrigation release from a dam in Australia and found that “macroinvertebrates had not recovered in 13 months, even though deposited sediments returned to preflood conditions in one year.” *Id.*

There is reason to believe that recovery times might be even longer than normal for Shanty Branch and Elick Hollow. The scientific literature provides that the primary recovery method for streams following a disturbance is downstream drift:

In summary, macroinvertebrate recovery times following pulse disturbances are affected by the presence of refugia, distance from refugia, time of year of disturbance, and life cycle characteristics. Downstream drift is the primary recolonization mechanism in lotic environments. If the disturbed area is far from refugia, vagility of adults and life-table characteristics (e.g., generation time and fecundity) assume more importance in dictating recovery rate. In general, however, population recovery is rapid, usually less than two years[.]

Tr. at 361 (from *Overview of Case Studies on Recovery of Aquatic Systems from Disturbance*). In Shanty Branch and Elick Hollow, however, there are no upstream areas from which aquatic

insects can drift. As Dr. Baker conceded, the upstream areas are occupied by valley fills and sediment ponds. Tr. at 362. Dr. Verslycke pointed out that this could make recovery in these streams slower than normal. Tr. at 273-74.

Faced with this abundant scientific literature, Dr. Baker ultimately conceded that streams do not fully recover within one month. But, he argued, sampling can still occur as long as the results are not an “anomaly” when compared to prior observations.

Q. Does your report cite any source for the proposition that recovery takes only one month?

A. No. I don’t believe I made that claim, did I?

Q. I think you told us all that—and so has Dr. Swan—that a general rule of thumb for recovery for macroinvertebrates is one month.

A. I think what we were saying is that we generally think that one month is a conservative period of time to wait after a storm event has occurred before you can sample again. That’s not the same thing necessarily as expecting the stream is fully recovered.

Q. Oh, okay. So you can go back down a month later and obtain results. They might not just be results that have fully recovered from the event.

A. Then you compare those results to what you observed before and see if there’s an anomaly.

Tr. at 360-61 (emphasis added). Dr. Baker cited no literature to support this new position. Nor did he explain how the August 2016 WVSCI scores—which were in some cases 20 points lower than in April 2016—were not an “anomaly.”

Dr. Baker also tried to argue that the historic rains in West Virginia may not have caused significant impacts in Leatherwood Creek, Shanty Branch, and Elick Hollow. But his efforts were unconvincing and utterly unsupported by the literature he cited. First, he tried to argue that flooding below Shanty Branch and Elick Hollow would have been tempered because valley fills in those streams retain water:

Assuming these valley fills are similar to others in the region, their impact would be to mediate the magnitude of any intense rain

event to their watersheds, resulting in a smaller peak flow and less intense scour in their drainages.

Tr. at 344. However, the paper cited by Dr. Baker for this proposition (Ross, 2016) actually says that larger storms produce *more* intense flows in mined areas, not less intense flows:

For smaller or less intense rainstorms, it is possible that reclaimed mine areas are able to effectively store incoming water, while for the largest or most-intense [sic] storms, areas of the mine with compacted soils reach excess infiltration quickly and generate a strong storm response.

Tr. at 345-46. Furthermore, the paper Dr. Baker cited (Ross, 2016) referenced another paper, entitled *Mountaintop Removal Mining and Catchment Hydrology*, that contained a similar conclusion for large storms:

Investigations into contemporary MTM/VF [mountaintop mining and valley fill] operations have involved hydrologic modeling or quantifying catchment outlet streamflow responses to precipitation inputs. These studies show an increase in baseflow in MTM/VF impacted catchment...and generally show increases in discharge for larger storm events[.]

Tr. at 347. So, according to the scientific literature, the impacts of the historic rain events in June 2016 might have been *even more intense* in Shanty Branch and Elick Hollow than in streams that do not contain valley fills.

Dr. Baker also tried to argue that the impact of flooding was not severe because similar numbers of aquatic insects were captured in April 2016 and August 2016. Tr. at 334-36. However, Dr. Baker conceded that he was merely comparing “subsamples” of aquatic insects captured in these two months. Under West Virginia’s sampling protocols, the total number of aquatic insects collected in a sample are spread across a tray, and organisms are picked from random “grids” until a “subsample” of 160 to 240 organisms is selected. DE 46 at 5-20; Tr. at 348. As Dr. Baker conceded, the subsample number does not provide any information on the

total number of organisms that were collected in the sample or how many organisms were present at the sites. Tr. at 334-35. As a result, comparing subsample results from April 2016 and August 2016 does not tell us whether there were fewer aquatic insects in Leatherwood Creek, Shanty Branch, or Elick Hollow following the historic storm of June 2016. Nor does such a comparison address the fact that certain insects, including stoneflies, recover more slowly from flooding events than other insects. Tr. at 358-59.

Dr. Baker also tried to argue that habitat (“Rapid Bioassessment Protocol”) scores taken by Fola after the historic storm showed little evidence of scouring or other physical impacts to the streams. Tr. at 336, 339, 351. However, the habitat scores relied upon by Dr. Baker were taken *four months* after the historic storm. Tr. at 365-66. Dr. Baker admitted that it was possible the stream changed during that four-month period. He also conceded that the habitat scores may not be “great evidence.” Tr. at 366. In any event, it is not necessary for scouring to take place before there are impacts to aquatic organisms. Plaintiffs’ expert Dr. Palmer previously published a paper showing that streams lose aquatic insects following storms even in the absence of scouring. Tr. 353-54.

E. Plaintiffs Should Not Be Allowed to Ignore the Post-Trial WVSCI Scores

Because the WVSCI scores from August 2016 may have been compromised by the historic June 2016 storm, Fola conducted additional sampling after the trial to gather a more recent look at the health of Leatherwood Creek, Shanty Branch, and Elick Hollow. Fola could not gather these scores until April of this year, because the WVSCI sampling protocol only recognizes scores gathered between April 15th and October 15th. Fola has moved to supplement the record with these scores, which are as follows:

Stream	April 2017
Leatherwood Creek	72.35
Elick Hollow	75.18
Shanty Branch	65.27

See ECF No. 78 and 78-1 at 3.

Up to and including trial, Plaintiffs have never questioned the validity of the WVSCI scores taken by Fola. The WVSCI scores from April 2017 were compiled by the same consultant and in the same fashion as the earlier scores. *See* ECF No. 78-1 at 1-2. Given the questions surrounding the August 2016 scores, the April 2017 scores should be admitted into evidence, as argued in Fola’s motion.

F. Plaintiffs Should Not Be Allowed to Change the Test for Impairment

Plaintiffs do not even attempt to explain how all three streams achieved at least one passing WVSCI score despite conductivity levels of 1,500 to 2,000 $\mu\text{S}/\text{cm}$. Instead, when confronted with evidence undercutting their theory of specific causation, they shift the discussion to the Genus Level Index of Most Probable Stream Status (“GLIMPSS”), claiming it is a better tool for measuring impairment. Then, relying on GLIMPSS, they cite the conclusory testimony of Dr. Baker that “he had no doubt the streams are impaired.” ECF No. 77 at 6-8.

In previous cases, this Court has relied on WVSCI to measure compliance with the narrative water quality standards, because it was the last methodology used by West Virginia to make determinations about whether to list a stream as impaired on the §303(d) list. *Elk Run*, 24 F.Supp.3d at 550; *Fola*, 82 F.Supp.3d at 679; *Fola* 2015 WL 4772351 at *3. But as Plaintiffs’ expert Dr. King conceded at trial, WVDEP has never used GLIMPSS to make impairment decisions. Tr. at 176.

Plaintiffs' sole legal basis for arguing that it is appropriate for the Court to adopt GLIMPSS as the measure of compliance is EPA's action when it reviewed WVDEP's 2014 §303(d) list. ECF No. 77 at 4 (citing PE 79). However, the selection of a particular GLIMPSS score to delineate impaired streams versus unimpaired streams is a value judgment regarding the biological assemblage that represents compliance with West Virginia's narrative water quality standards. Such a judgment is a policy decision committed to WVDEP, not to EPA or this Court. 33 U.S.C. §§ 1311(b)(1)(C) & 1313; *Ky. Waterways Alliance v. Johnson*, 540 F.3d 466, 493 (6th Cir. 2008); *Defenders of Wildlife v. EPA*, 415 F.3d 1121, 1127-28 (10th Cir. 2005). In addition, such a tool is considered a water quality standard that must undergo rulemaking procedures before it can be used to determine whether a stream is impaired. 40 C.F.R. §§ 25.10(b), 131.6(e), 131.20(c) & 131.21; *Simpson Tacoma Kraft v. Dept. of Ecology*, 835 F.2d 1030 (Wash. 1993) (state's attempt to translate narrative standard into numeric criterion invalid absent rulemaking); *Fla. Clean Water Network, Inc. v. EPA*, No. 4:09-cv-165, 2012 WL 1072216 at *3 (N.D. Fla. Mar. 30, 2012) (provisions that affect attainment decisions by State and define level of protection are water quality standards).

In addition, EPA did not take this action regarding the use of GLIMPSS until May 11, 2016—well after Fola's permit was issued and after Plaintiffs filed this citizen suit. ECF No. 48 at 5-6 (permit most recently reissued in April 2013); ECF No. 1 (Complaint filed Feb. 2, 2015). Permit holders are entitled to fair notice of the limits their discharges must comply with before they can be held liable in an enforcement action. *Wisconsin Res. Prot. Council v. Flambeau Min. Co.*, 727 F.3d 700, 707 (7th Cir. 2013); *U.S. v. Hoechst Celanese Corp.*, 128 F.3d 216, 224 (4th Cir. 1997). If the Court were to rely on GLIMPSS scores to find Fola liable for violating its permit based on EPA's 2016 letter, Fola would be deprived of fair notice.

Finally, if the Court were to change the compliance standard from WVSCI to GLIMPSS, that would contradict this Court's previous ruling that changes to standards cannot alter permit requirements absent a permit modification, which did not occur here. Memorandum Opinion and Order at 16-21, *OVEC, et al. v. Fola Coal Co., LLC*, No. 2:13-cv-21588 (S.D.W.Va. May 29, 2015), ECF No. 94.

G. The Competent WVSCI Scores Do Not Show an Impaired Stream

As described above, many of the WVSCI scores relied upon by Plaintiffs are incompetent. There are many reasons to believe the August 2016 scores were depressed by the June 2016 historic storm. Also incompetent are the WVSCI scores obtained when Dr. Swan failed either to comply with WVDEP sampling protocol or to gather enough aquatic insects to compute a valid WVSCI score: namely, the October 2015 score in Elick Hollow and the April 2016 score in Shanty Branch. When these incompetent scores are eliminated and the competent post-trial scores are added to the mix, the data do not clearly show streams that are impaired. Here are the competent scores compiled by Plaintiffs in October 2015, the average scores from both parties in April 2016, and the new scores obtained by Fola in April 2017:

Stream	October 2015 (OVEC)	April 2016 (Average, OVEC & Fola)	April 2017 (Fola)
Leatherwood Creek	75.4	70.1	72.35
Elick Hollow	n/a	70.8	75.18
Shanty Branch	69.4	66.9	65.27

This Court should not order the parties to address a remedy for streams that are not clearly impaired.

IV. CONCLUSION

For the foregoing reasons, Plaintiffs have failed to meet their burden of proof and the Court should enter judgment in Fola's favor.

Respectfully submitted,

FOLA COAL COMPANY, LLC

By counsel:

s/ Jennifer L. Hughes

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**IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA
AT HUNTINGTON**

**OHIO VALLEY ENVIRONMENTAL
COALITION, WEST VIRGINIA
HIGHLANDS CONSERVANCY, WEST
VIRGINIA RIVERS COALITION, and
SIERRA CLUB,**

CASE NO. 2:15-cv-1371

Plaintiffs,

v.

FOLA COAL COMPANY, LLC,

Defendant.

CERTIFICATE OF SERVICE

I, Jennifer L. Hughes, hereby certify that on May 3, 2017, I electronically filed the foregoing *Defendant's Post-Trial Brief* with the Clerk of the Court using the CM/ECF system, which will send notification of such filing to the following CM/ECF participants:

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